

Taxonomic Notes of Tribe Phycitini (Lepidoptera, Pyralidae, Phycitinae) from Korea (III)

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Abstract Six species of Phycitini from Korea are dealt with illustrations of adults and genitalia of both sexes. Known host plants also are listed. Female of *Psorosa taishanella* Roesler is described for the first time. Among them, three species, *Nephopterix immatura* Inoue, *N. maenamii* Inoue, *Pempelia ellenella* (Roesler), are reported for the first time from Korea.

Key words Systematics, Lepidoptera, Pyralidae, Phycitinae, Phycitini, newly recorded, Korea

INTRODUCTION

The species of tribe Phycitini are hardly distinguishable by external characters because of similarity of their coloration and makings of forewing patten. From the other hand it includes many species which are agricultural and forest pests attacking conifers, fruits, and stored crops. Since Leech (1901) recorded three species of Phycitini, a total of 55 Phycitinae species have been recorded in Korean peninsula. In the present paper, which is the third part of the revisional studies of Korean tribe Phycitini, further six species are dealt with brief redescription, and illustrations of male and female genitalia. Among them, three species, i.e., *Nephopterix immatura* Inoue, *N. maenamii* Inoue, *Pempelia ellenella* (Roesler), are reported for the first time from Korea. We also redescribed, *Psorosa taishanella* Roesler, *Pyla manifestella* Inoue, and *Pempelia maculata* (Staudinger), which have been previously little known in Korea.

Abbreviations for depositories of the specimens used in this study are as follows: NIAST- National Institute of Agricultural Science and Technology, Suwon; FRI- Forestry Research Institute, Seoul; CIS- Center for Insect Systematics, Kangwon National University, Chunchon; UIB- Department of Biology, University of Incheon, Incheon; NP- North Pyungan Prov.; SP- South Pyungan Prov.; GW- Gangwon Prov.; GG- Gyunggi Prov.; JN- Jeonnam Prov.; GB- Gyungbug Prov.; CJ- Cheju Prov.

***Nephopterix maenamii* Inoue 남방알락명나방 (신칭)**

(Figs 1, 7, 13, 19)

Nephopterix maenamii Inoue, 1959, Tinea 5: 295, fig. 4; Inoue, 1982, 1: 391, 2: 250, pl. 47, fig. 28.
TL: Japan.

Diagnosis. Wing expanse, 23–26 mm. This species can be separated from the similar species, *N. immatura* Inoue, by the median line thick and dark fuscous, and the submarginal line slightly bent in the forewing.

Male genitalia (Fig. 7). Uncus long subtriangular with pointed apex, dorsally covered with very short hairs. Apical process of gnathos arrowhead-shaped, slightly hooked, pointed. Valva rather narrow, with rounded terminal margin; clasper bent downward, parallel to surface of harpe; saccus narrow, weakly developed. Vinculum sclerotized, rectangularly developed, almost of the same length as valva. Aedeagus large, about 1.4 times as long as valva. Structure of 8th abdomen shown in fig. 13.

Female genitalia (Fig. 19). Apophysis posterioris almost of same length as anterioris one. Ostium bursae sclerotized, large, medially convex. Ductus bursae short, membranous, basally broad. Ductus seminalis broad, membranous, originating from near middle of corpus bursae. Corpus bursae moderately oval, shallow anteriorly divided; signum rudimentary.

Material examined. GW– 1 ♀, Mt. Gyeong, 2. VIII. 1989 (K.T. Park), CIS, gen. sl. no. CIS-1006; 1 ♂, Mt. Jeombong, 11. VIII. 1997 (Paek, Lee, Jang, Choi & Kim), UIB, gen. sl. no. UIB-1685. JN– 1 ♀, Mt. Deogyu, 18. VII. 1998 (Bae *et al.*), UIB, gen. sl. no. UIB-1828.

Distribution. Korea (GW, JN) and Japan (Honshu, Kyushu).

Host plant. Unknown.

Remarks. Moths were collected from mid July to mid August.

***Nephopterix immatura* Inoue 황토색알락명나방 (신칭)**

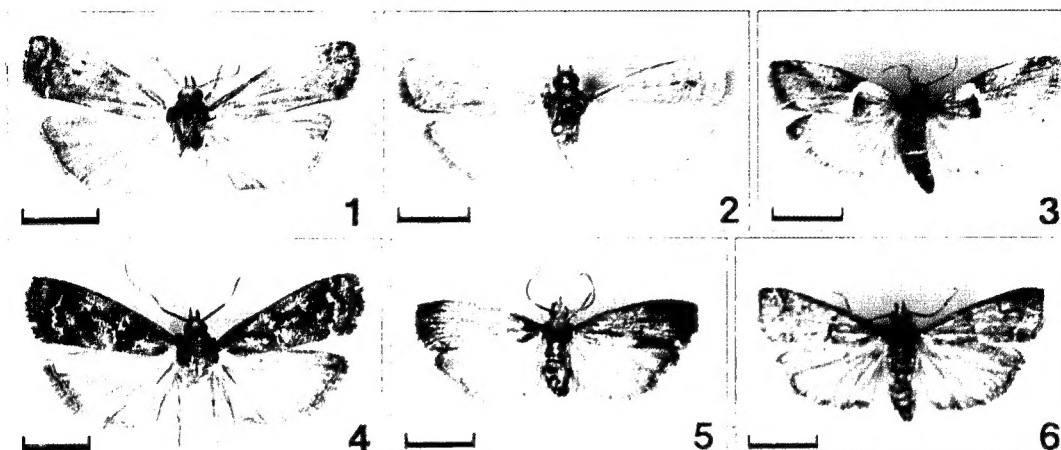
(Figs 2, 8, 15, 20)

Nephopterix immatura Inoue, 1982, 1: 392, 2: 250, pl. 47, fig. 29, pl. 311, fig. 4, pl. 314, fig. 2. TL: Japan.

Diagnosis. Wing expanse, 21–23 mm. This species is characterized by the following features: labial palpus strongly upturned, brownish fuscous; basal and median segment covered with pale grayish white scales at inner surface. Ground color of forewing fuscous brown; costal area almost wholly white; small white bar on about 1/2 of dorsum; submarginal lines brownish dirty white, slightly bent.

Male genitalia (Fig. 8). Quite similar to those of preceding species, *maenamii* Inoue, but can be separated from the latter by the rounded uncus and slightly developed saccus. Structure of 8th abdomen shown in fig. 15.

Female genitalia (Fig. 20). Apophysis posterioris long, about 1.4 times as long as apophysis anterioris. Ostium bursae large, simple rounded, long cylindrical. Ductus bursae short, membranous. Ductus



Figs 1-6. Phycitini spp., adults: 1. *Nephoterix maenamii* Inoue, ♀; 2. *N. immatura* Inoue, ♀; 3. *Psorosa taishanella* Roesler, ♀; 4. *Pyla manifestella* Inoue, ♀; 5. *Pempelia maculata* (Staudinger), ♀; 6. *P. ellenella* (Roesler), ♀. [Scales: 5.0 mm.]

seminalis membranous, broad, originating from near middle of corpus bursae. Corpus bursae oblong, strongly wrinkled; signum rudimentary.

Material examined. GG- 1 ♀, Suwon, 10. IX. 1974 (J.C. Paik), NIAST, gen. sl. no. UIB-1843, 1 ♂, 20. VI. 1982 (C.H. Ryu), CIS, gen. sl. no. CIS-2779, 1 ♀, 19. VII. 1982 (C.H. Ryu), CIS, gen. sl. no. CIS-2780; 1 ♀, Mt. Hwaya, 5. IX. 1998 (M.K. Paek & B.W. Lee), UIB.

Distribution. Korea (GG) and Japan.

Host plant. Unknown.

Remarks. Moths were collected from late June to mid September.

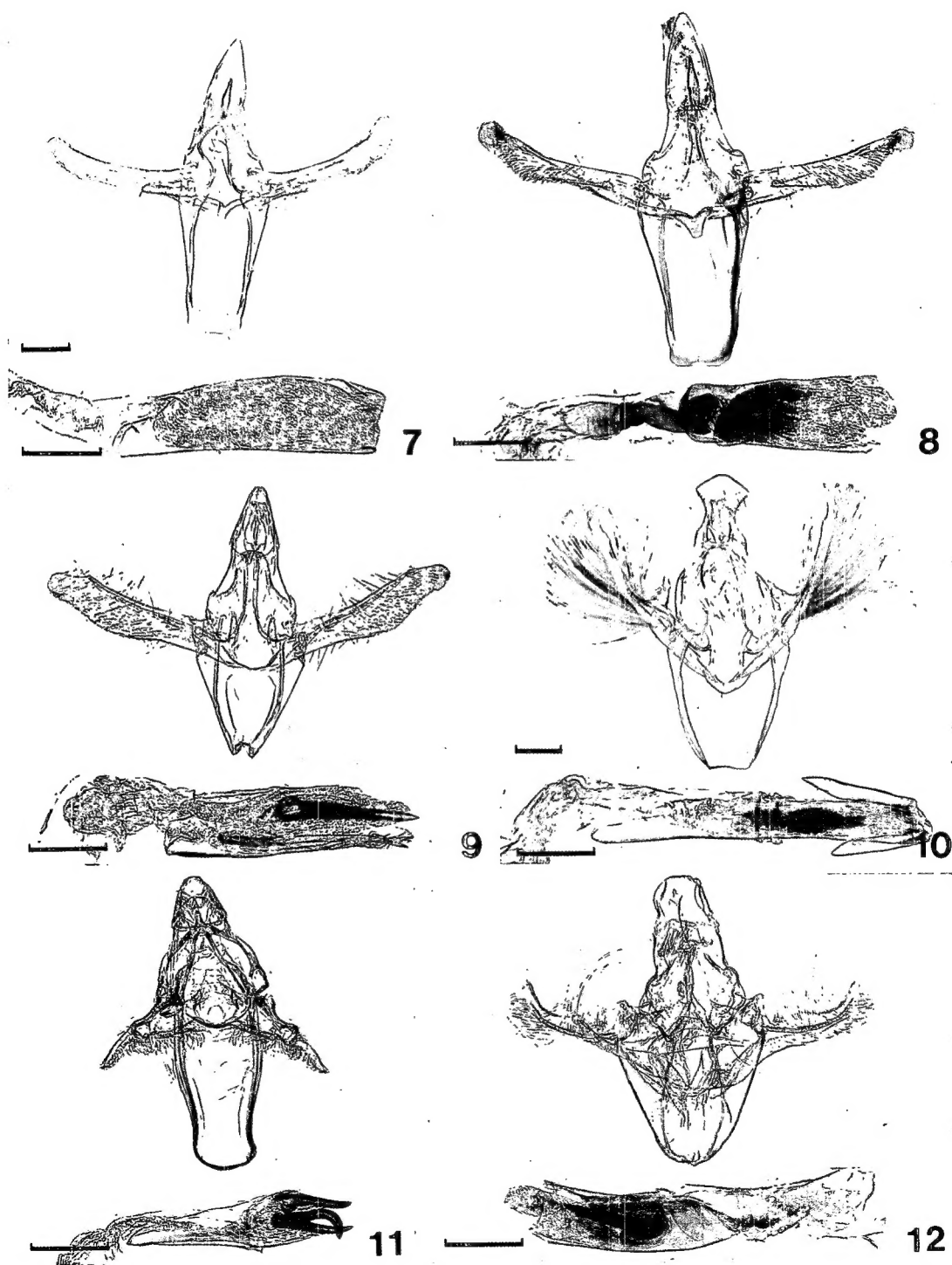
***Psorosa taishanella* Roesler 북송아잎말이알락명나방**

(Figs 3, 9, 16, 21)

Psorosa taishanella Roesler, 1975, Dt. ent. Z. (N.F.) 22: 94; Inoue, 1982, 1: 402, 2: 253, pl. 48, fig. 28; Park, 1993: 164; Check list Ins. Korea, 1994: 338. TL: China.

Diagnosis. Wing expanse, 21–23 mm. This species can be easily separated from the other species by the following characters: vertex of head with apically white scale; labial palpus fuscous brown, covered with white scales at inner surface. Ground color of forewing fuscous purplish brown; costal area between antemedian and submarginal lines irregularly suffused with white; submarginal line obscure.

Male genitalia (Fig. 9). Uncus subtriangulate, bluntly pointed at apex, dorsally covered with very short hairs. Gnathos lemonlike, with nipplelike apical process and split at base. Juxta U-shaped, with slender lateral arms bearing, short hairs at tips. Valva narrow, with rounded terminal margin; costa well sclerotized, about 3/4 of valva; harpe small; saccus slightly sclerotized. Vinculum sclerotized, about 0.8 times as long as valva. Aedeagus large, about 1.3 times as long as valva; two cornuti large, strong,



Figs 7-12. Phycitini spp., male genitalia, caudal view: 7. *Nephopterix maenamii* Inoue; 8. *N. immatura* Inoue; 9. *Psorosa taishanella* Roesler; 10. *Pyla manifestella* Inoue; 11. *Pempelia maculata* (Staudinger); 12. *P. ellenella* (Roesler). [Scales: 0.5 mm.]

different in size. Structure of 8th abdomen shown in fig. 16.

Female genitalia (Fig. 21). Apophysis posterioris straight, rather long, about 1.3 times as long as apophysis anterioris. Ostium bursae wide, bowl-shaped, slightly sclerotized. Ductus bursae broad and posteriorly sclerotized; colliculum long, about 1/2 of ductus bursae, with several longitudinal grooves. Ductus seminalis broad, membranous, originating from near swelled posterior part of corpus bursae. Corpus bursae anteriorly ovate; signum plated.

Material examined. GW- 1 ♀, Chuncheon, 8. VI. 1985 (K.T. Park), CIS, 1 ♀, 7. VII. 1987 (K.T. Park), CIS, 3 ♂, 2 ♀, 30. VII. 1987 (K.T. Park), CIS, 2 ♂, 1 ♀, 30. VII. 1988 (H.Y. Choi), CIS, 2 ♀, 9. IX. 1988 (H.Y. Choi), CIS, 1 ♂, 1 ♀, 15. IX. 1988 (H.Y. Choi), CIS, 4 ♂, 4 ♀, 23. IX. 1988 (H.Y. Choi), CIS, 1 ♂, 16. V. 1989 (K.T. Park & B.K. Byun), CIS, 1 ♀, 29. V. 1989 (K.T. Park), CIS; 1 ♂, Yangyang, 4. VI. 1987 (K.T. Park), CIS, gen. sl. no. CIS-2359; 1 ♀, Youngweoul, Moonsan-ri, 7. VI. 1996 (H.K. Lee), FRI. GG- 1 ♀, Gwangneung, 15. VII. 1972 (S.M. Lee), CIS, gen. sl. no. CIS-2745; 1 ♀, Seoul, Hongneung, 16-19. VI. 1997 (B.K. Byun), FRI, 1 ♂, 1 ♀, 3. VI. 1998 (B.K. Byun), FRI, gen. sl. no. UIB-1835 (♀). JN- 1 ♂, Mt. Paekun, 19. VII. 1998 (Bae *et al.*), UIB, gen. sl. no. UIB-1834.

Previous Record. Park (1993): SP- Mt. Daesoung (N. Korea).

Distribution. Korea (SP, GW, GG, JN), Japan, and China.

Host plants. *Prunus* sp. (Rosaceae); *Prunus* sp. (Rosaceae) and *Prunus persica* (Rosaceae) in Korea (Park, 1993); *Prunus persica* (Rosaceae) in Japan (Inoue, 1982).

Remarks. This species was originally described from the male specimens collected from China. The female, hitherto unknown, is described and figured for the first time. This species was first listed in Korean peninsula by Park (1993), without any taxonomical information. Biology of this species is little known. Moths were collected from early June to late September. Larvae tie two or three spun leave of the host plant and feed in it from July to September.

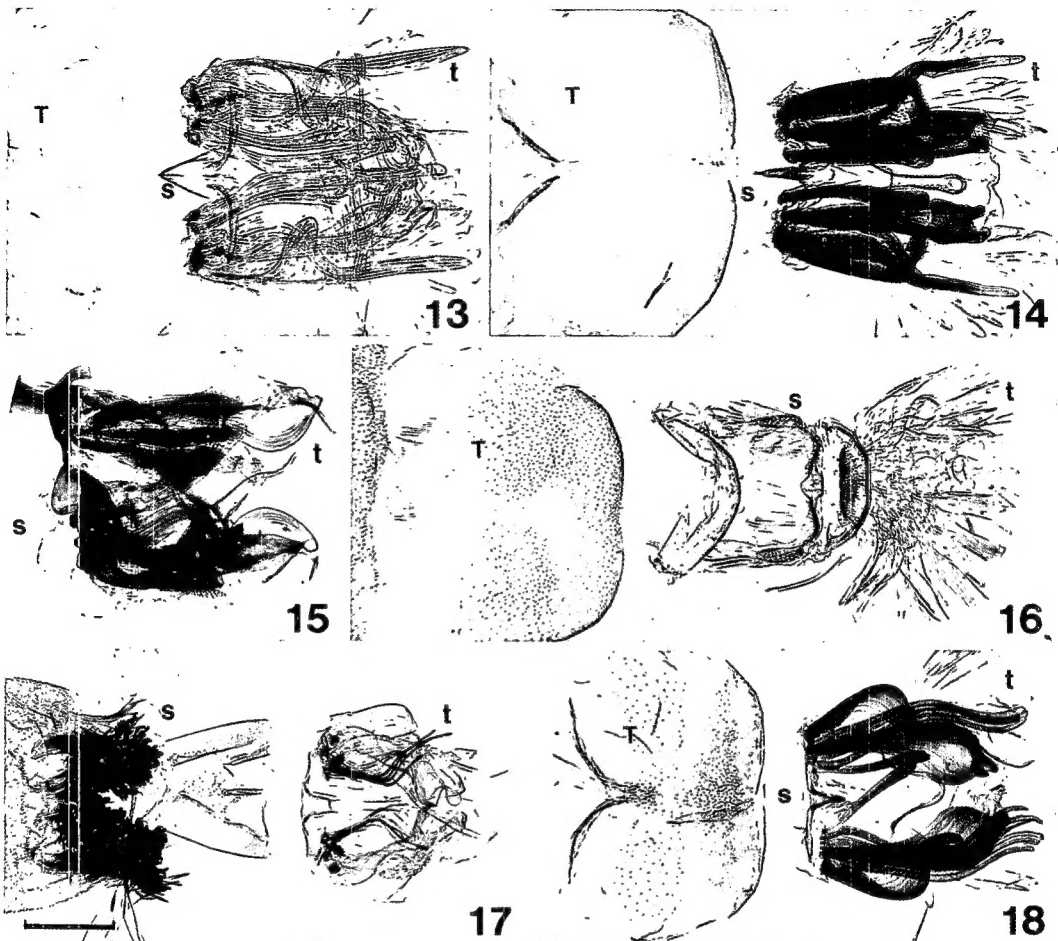
***Pyla manifestella* Inoue 검붉은알락명나방**

(Figs 4, 10, 14, 22)

Pyla manifestella Inoue, 1982, 1: 400, 2: 252, pl. 48, fig. 18, pl. 311, fig. 7, pl. 314, fig. 5; Park, 1993: 164; Check list Ins. Korea, 1994: 338. TL: Japan.

Diagnosis. Wing expanse, 22-25 mm. This species is characterized by the following features: antenna blackish fuscous; in male broad swelled at base of flagellum, with large scales; in female filiform, short ciliate; labial palpus upturned, reaching to vertex, mixed with reddish brown and dark brownish gray. Ground color of forewing dark reddish brown, median area in male more paler than in female; subbasal and antemedian lines silvery white; submarginal line silvery white, in female slightly angled, in male almost smooth.

Male genitalia (Fig. 10). Uncus bluntly pointed at apex, dorsally covered with very short hairs, both lateral sides broadly concave, with several long hairs. Apical process of gnathos rather small, strongly hooked, pointed at apex. Juxta U-shaped, with slender lateral arms, basal broad near base. Valva very narrow, with rounded terminal margin; harpe finger-like, well developed; saccus slightly sclerotized.



Figs 13-18. Phycitini spp., 8th abdominal tergites (T), sternites (s) and tufts (t): 13. *Nephopterix maenamii* Inoue; 14. *Pyla manifestella* Inoue; 15. *Nephopterix immatura* Inoue; 16. *Psorosa taishanella* Roesler; 17. *Pempelia maculata* (Staudinger); 18. *P. ellenella* (Roesler). [Scale: 0.5 mm.]

Vinculum sclerotized, truncate at terminal margin, about 0.9 times as long as valva. Aedeagus large, about 1.4 times as long as valva, armed with two strong spines at top. Structure of 8th abdomen shown in fig. 14.

Female genitalia (Fig. 22). Papilla analis bluntly pointed at apex. Apophysis posterioris about 1.3 times as long as apophysis anterioris. Ostium bursae wide, bowl-shaped. Posterior part of ductus bursae cylindrical, sclerotized, and anterior part largely oblong swelled, with numerous small spines on near anterior end. Ductus seminalis basally broad, armed with numerous minute spine inner surface, originating from near swelled posterior part of corpus bursae. Corpus bursae ovate, covered with small spines excepting near basal part of ductus seminalis; signum rudimentary.

Material examined. GW- 1 ♂, Hoengsung, 6. VII. 1990 (S.H. Oh & H.Y. Choi), CIS; 1 ♂, Hongcheon, 4. VIII. 1989 (H.Y. Choi), CIS, gen. sl. no. CIS-2734. GG- 1 ♂, Seoul, 24. VI. 1961

(K.T. Park), CIS; 1 ♀, Gwangneung, 22. VIII. 1980 (K.J. Won), CIS, 1 ♀, 22. VII. 1986 (K.T. Park & U. Park), CIS, gen. sl. no. CIS-2361, 2 ♀, 10. VII. 1990 (K.T. Park), CIS, gen. sl. no. CIS-2781, 4 ♂, 29. VI. 1998 (B.K. Byun & Y.S. Park), FRI; 1 ♀, Mt. Chonma, 13. VII. 1996 (Y.S. Bae), UIB, gen. sl. no. UIB-1748; 2 ♂, 1 ♀, Seoul, Hongneung, 27. VI. 1996 (B.K. Byun), FRI, 1 ♂, 23. VI. 1997 (B.K. Byun), FRI, gen. sl. no. UIB-1830; 1 ♂, Mt. Inwang, 23. VII. 1998 (S.Y. Sim), FRI. GB- 1 ♂, Isl. Ulreung, 23. VII. 1998 (S.S. Kim). CJ- 1 ♂, Isl. Cheju, Chungmum, 24. VII. 1997 (S.S. Kim).

Previous Record. Park (1993): NP- Mt. Myohyang (N. Korea); GW- Mt. Kumgang (N. Korea).

Distribution. Korea (NP, GW, GG, GB, CJ), Japan, and China.

Host plant. Unknown.

Remarks. This species was described by Inoue (1982) without comments for the genitalia. The genitalia of both sexes are described here for the first time. Moths were collected from late June to late August.

***Pempelia maculata* (Staudinger) 주황점알락명나방**

(Figs 5, 11, 17, 23)

Nephopteryx maculata Staudinger, 1876, Stettin. ent. Ztg. 1876: 143. TL: Ussuri, South Russian Far East.

Nephopteryx coerulentella (part.): Rogonot, 1893, 7: 199; Rebel, 1901, 2: 36.

Selebria morosalopsidis Roesler, 1975, Dt. ent. Z. (N.F.) 22: 83, figs 4-6; Inoue, 1982, 1: 393; 2: 250, pl. 47, fig. 37.

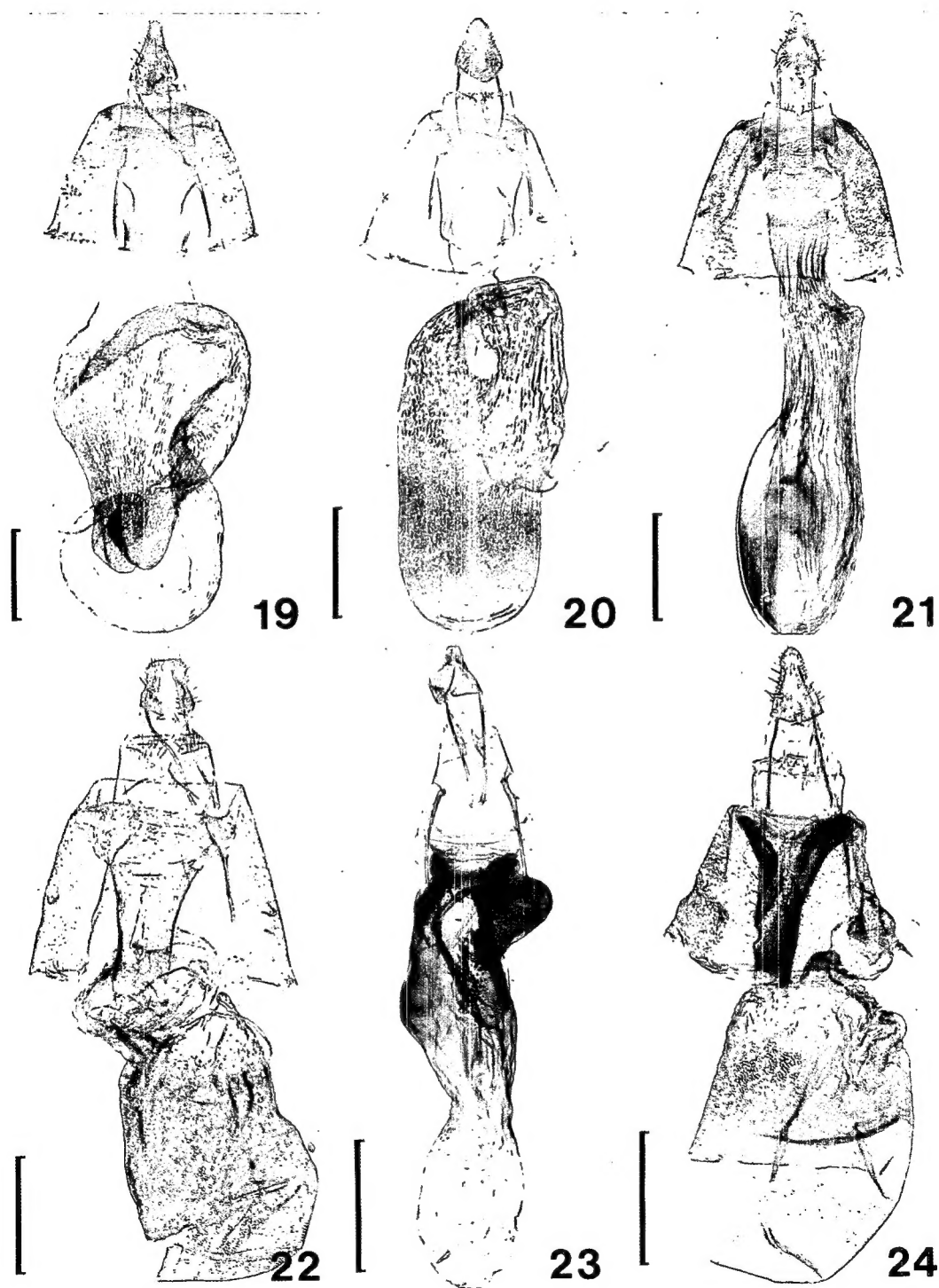
Pempelia maculata (Staudinger): Inoue, 1988, Tinea 12(10): 88; Park, 1993: 163; Check list Ins. Korea, 1994: 338.

Diagnosis. Wing expanse, 20-22 mm. This species can be easily distinguished from the other species by the blackish brown ground color of the forewing, with a light orange spot in hind margin medially.

Male genitalia (Fig. 11). Uncus rounded at apex, laterally covered with long hairs. Apical process of gnathos small, hooked, pointed at apex. Juxta broad, U-shaped, with small lateral arms. Valva very short, gradually tapering toward apex, bird-wing-shaped; costa well sclerotized; harpe sawlike, sclerotized; saccus well developed, with laterally long hairs. Vinculum sclerotized, large, about 1.7 times as long as valva. Aedeagus large, about 2.2 times as long as valva, with posteriorly three strong cornuti. Structure of 8th abdomen shown in fig. 17.

Female genitalia (Fig. 23). Apophysis anterioris about same times as long as apophysis posterioris. Ostium bursae broad, weakly sclerotized. Ductus bursae very short. Ductus seminalis membranous, originating from near posterior part of corpus bursae. Corpus bursae oblong, strongly sclerotized in posterior part; signum plated, well sclerotized, with numerous thornlike dents.

Material examined. GW- 1 ♀, Mt. Seolak, 17. VII. 1977 (H. Kuroko), CIS, gen. sl. no. CIS-2748; 2 ♂, Chuncheon, 12. VI. 1989 (K.T. Park & B.K. Byun), CIS; 1 ♂, Mt. Palbong, 5. VII. 1990 (D.S. Park), CIS. GG- 1 ♂, Isl. Yongjong, 15. VI. 1998 (Bae, Paek, Lee & Ahn), UIB; 1 ♂, Mt. Inwang, 23. VII. 1998 (S.Y. Sim), FRI. GB- 1 ♂, Mt. Sokri, 17. VII. 1998 (Paek, Ahn & Kim), UIB; 1 ♂, Mt. Sobaek, 18. VII. 1998 (Paek, Lee & Song), UIB. CJ- 1 ♂, Mt. Hanra, 25. V. 1988 (K.T. Park), CIS, gen. sl. no.



Figs 19-24. Phycitini spp., female genitalia, ventral view: 19. *Nephopterix maenamii* Inoue; 20. *N. immatura* Inoue; 21. *Psorosa taishanella* Roesler; 22. *Pyla manifestella* Inoue; 23. *Pempelia maculata* (Staudinger); 24. *P. ellenella* (Roesler). [Scales: 1.0 mm]

CIS-2322; 3 ♂, Jeju N. Univ., 17-18. V. 1991 (K.T. Park), CIS, gen. sl. no. UIB-1730, 1731.

Previous Record. Park (1993): NP- Mt. Myohyang (N. Korea).

Distribution. Korea (NP, GW, GG, GB, CJ), Japan, China, and S.E. Siberia.

Host plant. Unknown.

Remarks. The species was first listed for Korean peninsula by Park (1993), without taxonomic information. Moths were collected from mid May to late July.

***Pempelia ellenella* (Roesler) 가는줄알락명나방 (신칭)**

(Figs 6, 12, 18, 24)

Salebria ellenella Roesler, 1975, Dt. ent. Z. (N.F.) 22: 80. TL: China.

Pempelia ellenella: Fletcher & Nye, 1984: 115; Hepper & Inoue, 1992: 92.

Diagnosis. Wing expanse, 20-22 mm. This species is characterized by the following features: frons and vertex dirty white; labial palpus upturned, reaching to vertex, mixed with brownish gray and grayish white scales. Thorax dark gray. Ground color of forewing pale brownish gray; antemedian line dirty white, with two black lines; submarginal line dirty white, inwardly black spreading.

Male genitalia (Fig. 12). Uncus rather broad, with lateral sides infolded, shallowly split at apex, dorsally covered with numerous hairs. Gnathos triangular, with pointed apical process. Juxta U-shaped. Valva narrow, strongly incurved, with noticeable projection at apex of costa; costa broad, well sclerotized; saccus slightly sclerotized. Vinculum sclerotized, about 1.4 times as long as valva. Aedeagus large, about 1.6 times as long as valva, with large strong cornutus. Structure of 8th abdomen shown in fig. 18.

Female genitalia (Fig. 24). Apophysis posterioris rather long, about 1.2 times as long as apophysis anterioris. Ostium bursae wide. Ductus bursae strongly sclerotized, with asymmetrically infolded inside margin, and with minutely dents on outer margin. Ductus seminalis membranous, slender, originating from near swelled posterior part of corpus bursae. Corpus bursae ovate; signum rudimentary.

Material examined. GW- 1 ♂, Yangyang, 4. VI. 1987 (K.T. Park), CIS, gen. sl. no. CIS-2359; 1 ♀, Youngweoul, Moonsan-ri, 7. VI. 1996 (H.K. Lee), FRI. GG- 1 ♀, Gwangneung, 15. VII. 1972 (S.M. Lee), CIS, gen. sl. no. CIS-2745; 1 ♀, Seoul, Hongneung, 16-19. VI. 1997 (B.K. Byun), FRI, 1 ♂, 1 ♀, 3. VI. 1998 (B.K. Byun), FRI, gen. sl. no. UIB-1835 (♀). JN- 1 ♂, Mt. Paekun, 19. VII. 1998 (Bae et al.), UIB, gen. sl. no. UIB-1834.

Distribution. Korea (GW, GG, JN) and China.

Host plant. Unknown.

Remarks. *Salebria* Zeller was treated as a junior objective synonym of the genus *Pempelia* Hübner (Fletcher & Nye, 1984). Moths were collected from early June to mid July.

ACKNOWLEDGEMENTS

We are very grateful to professor Kyu-Tek Park of CIS for his constant guidance. He also gave us an opportunity to examine the material. For the generous loan of material, our cordial thanks are due to the

late Dr. S.B. Ahn (NIAST); Dr. B.K. Byun (FRI), and to Messrs. B.W. Lee, N.H. Ahn, Y.K. Kim, J.S. Lee and S.S. Kim kindly assisted in collecting the material used in this study. This work was supported in part by a grant from the Korea Science and Engineering Foundation (KOSEF, 981-0603-013-2).

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韓國產 알락명나방族 (나비目, 명나방科, 알락명나방亞科)의 分類學的 研究 (III)

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알락명나방族의 *Nephoterix maenamii* Inoue (남방알락명나방), *N. immatura* Inoue (황토색알락명나방), *Pempelia ellenella* (Roesler) (가는줄알락명나방) 3種을 韓國未記錄種으로 報告하며, *Psorosa taishanella* Roesler (복숭아잎말이알락명나방)의 암컷을 최초로 기재하였다. 그리고 *Pyla manifestella* Inoue (검붉은알락명나방), *Pempelia maculata* (Staudinger) (주황점알락명나방)을 포함하여 이들에 대한 成蟲, 生殖器의 그림 및 寄主植物의 기록을 整理하였다.

검색어 : 분류, 나비목, 명나방과, 알락명나방아과, 알락명나방족, 한국미기록

(Received: January 6, 1999)

(Accepted: April 22, 1999)